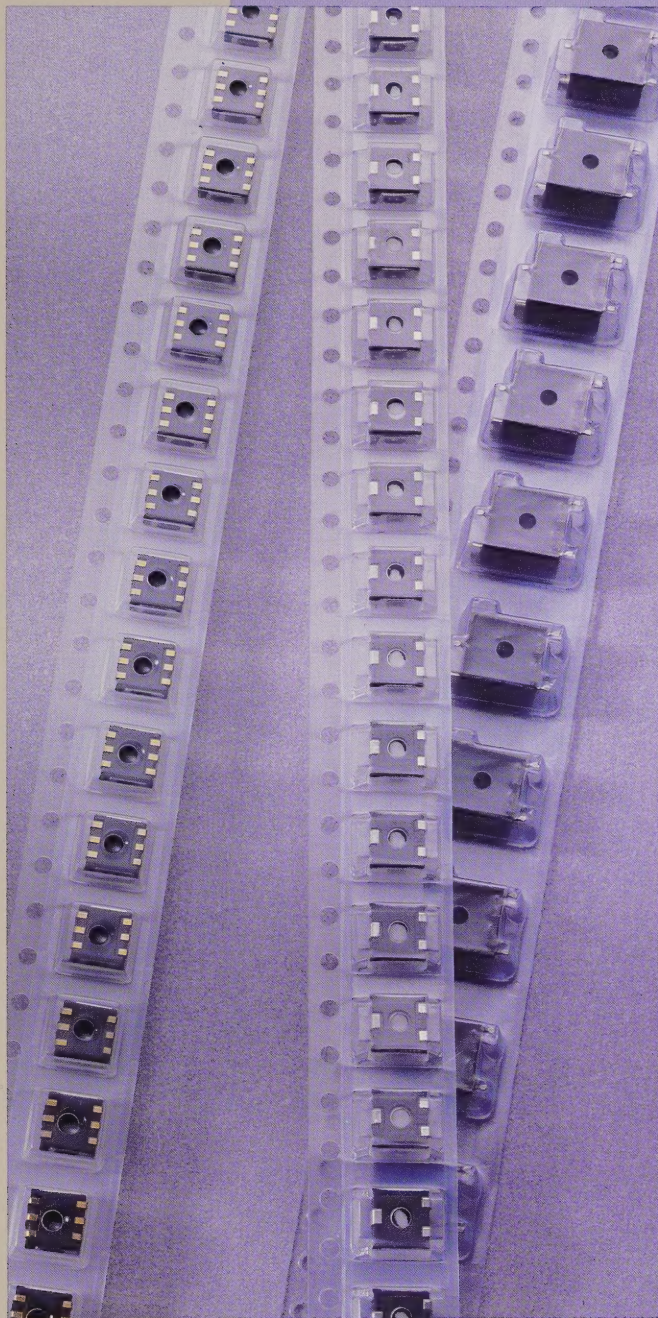


# MEPCOPAL *Trimmers & Switches*



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**A Company and**

---

**Product Specifications Guide**

---



# The Company



A joint venture of Philips Components, Discrete Products Division and Copal Electronics. Philips Components is the exclusive sales agent for Mepcopal products.

## Our History. 35 years of operation in San Diego.

- ▶ 1954, Microelectron Company is founded in San Diego
- ▶ 1963, Electra acquires Microelectron
- ▶ 1969, Electra grants Copal Electronics a license for cermet trimmer manufacturing in Japan
- ▶ 1971, North American Philips acquires Electra and merges it with Mepco to form Mepco/Electra
- ▶ 1986, Centralab is merged with Mepco/Electra to form Mepco/Centralab
- ▶ 1986, Mepcopal is formed as a joint venture company of Mepco/Centralab and Copal Electronics, USA
- ▶ 1989, Mepco/Centralab, Amperex and Ferroxcube are merged to form Philips Components, Discrete Products Division





# Trimmers & Switches

I'm interested  
in more information  
about **Mepcopal's** performance  
proven products. Note my interest in:

- ☐ Trimmers — part # \_\_\_\_\_
  - ☐ Surface Mount
  - ☐ Tape & Reel
  - ☐ Leaded
- ☐ Switches \_\_\_\_\_
- ☐ Other \_\_\_\_\_
- ☐ Mail me literature.
- ☐ Have a sales representative contact me.

Name: \_\_\_\_\_

Position: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ / \_\_\_\_\_ Ext: \_\_\_\_\_



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES.

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# BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 201960, SAN DIEGO, CA

---

POSTAGE WILL BE PAID BY ADDRESSEE

MEPCOPAL CO.  
11468 Sorrento Valley Road  
San Diego, CA 92121-9868





Mepcopal Company, 11468 Sorrento Valley Rd., San Diego, CA 92121 (619) 453-0332 TWX: 910-337-1120 FAX: (619) 481-1123

January 10, 1990

Dear Prospective Customer:

Enclosed is the data sheet you requested.

For more information, price quotes or to arrange a visit by a sales engineer, please contact your local Philips Components sales representative.

Thank you for your interest in MEPCOPAL's products.

Sincerely,

A handwritten signature in cursive script, reading "Leona Anderson".

Leona Anderson  
Marketing Manager

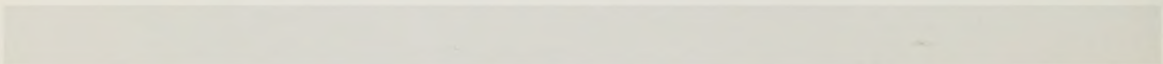
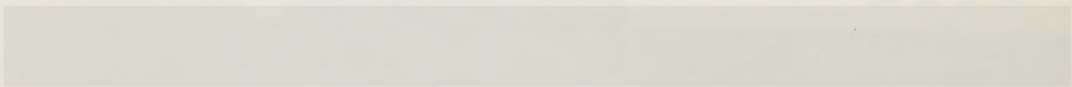
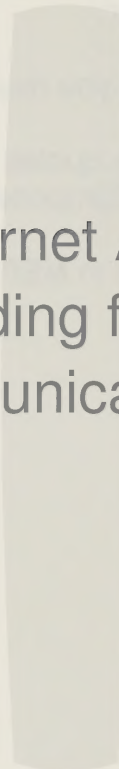
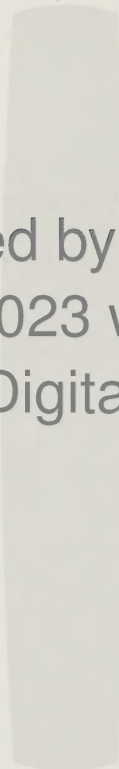
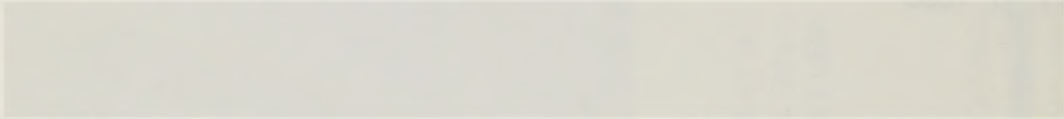
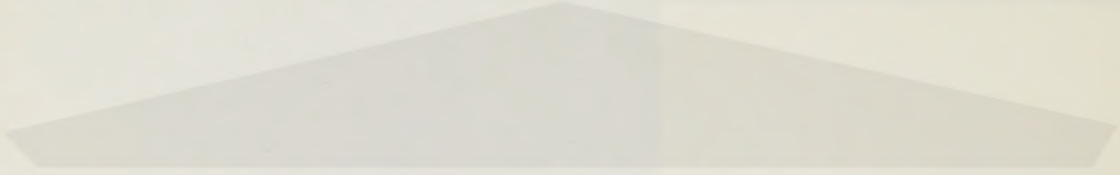
LA/ew

Enclosure

MEPCOPAL COMPANY is a joint venture of Copal Electronics, U.S.A.  
and Philips Components, Discrete Products Division



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<https://archive.org/details/mepcopaltrimmers00unse>



# MEPCOPAL

## SURFACE MOUNT 4 mm SQUARE SINGLE TURN CERMET MODEL : ST-4

- O RING SEALED
- VERTICAL AND HORIZONTAL ADJUSTMENT SYLES
- GULL WING, J LEAD AND THRU HOLE PIN STYLES
- PRECIOUS METAL ALLOY CONTACT
- TAPE AND REEL, MAGAZINE AND BULK PACKAGING

### SPECIFICATIONS :

#### ELECTRICAL

RESISTANCE RANGE	: 10 Ohms to 2 Meg Ohms
RESISTANCE TOLERANCE	: +/- 20% Standard
TEMP. COEFF. OF RESISTANCE	: 100 Ohms to 2 Meg. +/- 100 ppm, others +/- 250 ppm.
POWER RATING	: 1/4 Watt at 70° C
OPERATING VOLTAGE MAX.	: 200 VDC or Power Rating, whichever is less.
WIPER CURRENT MAX.	: 100 mA or power rating, whichever is less.
ELECTRICAL ANGLE, NOMINAL	: 210° Nominal.
ELECTRICAL CONTINUITY	: Continuous over full mechanical range.
END RESISTANCE	: 1% or 2 Ohms, whichever is greater.
RESOLUTION	: Essentially infinite.
CONTACT RESISTANCE VARIATION	: 1% or 3 Ohms, wichecker is greater.
OPERATING TEMP. RANGE	: -55° C to 125° C.
INSULATION RESISTANCE, MIN.	: Min 1000 Meg. at 500 VDC for 2 minutes.
DIELECTRIC STRENGTH	: 500 VAC rms, 1 minute, 1 milliamp max.

#### MECHANICAL

MECHANICAL ANGLE, NOMINAL	: 240° Nominal
OPERATING TORQUE	: 100 gram-cm max. (1.39 Oz-in.)
STOP STRENGTH, MIN.	: 300 gram-cm min. (4.17 Oz-in.)
ROTATIONAL LIFE	: 100 cycles, delta R13 <= 2 Ohms + 3%
PIN STYLES	: A, B, C, G, MA, MB, MC, TA, TB, TG

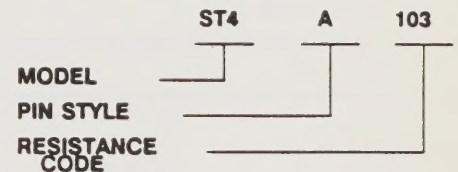
### ENVIRONMENTAL (MIL-R-22097)

THERMAL SHOCK : (-55°C to 125°C)	▲ R/R ≤ 2.00 % ▲ SS ≤ 1.00 %
HUMIDITY : (80 - 98% RH, 240 Hrs.)	▲ R/R ≤ 2.00 %
MECH. SHOCK : (100 g, 6 axes, 3 times)	▲ R/R ≤ 1.00 % ▲ SS ≤ 1.00 %
VIBRATION : (20 g, 10 to 2000 Hz.)	▲ R/R ≤ 1.00 % ▲ SS ≤ 1.00 %
LOW TEMP. OPERATION : (-55°C, 2 Hrs.)	▲ R/R ≤ 2.00 % ▲ SS ≤ 2.00 %
HIGH TEMP. EXPOSURE : (125°C, 250 Hrs.)	▲ R/R ≤ 3.00 % ▲ SS ≤ 2.00 %
LOAD LIFE : ( 70 °C, 0.25_ W, 1000 Hrs.)	▲ R/R ≤ 3.00 % ▲ SS ≤ 1.00 %
SOLDERING HEAT : (260°C, 10 Sec. or 215°C, 3 minutes)	▲ R/R ≤ 1.00 %
IMMERSION : Fluorocarbon Liquid, 85 ° C, 1min.	No Leaks

### STANDARD RESISTANCE VALUES AND CODES

Ω	CODE	Ω	CODE
10	100	20 K	203
20	200	50 K	503
50	500	100 K	104
100	101	200 K	204
200	201	500 K	504
500	501	1 M	105
1 K	102	2 M	205
2 K	202		
5 K	502		
10 K	103		

### PART NUMBER :



### MARKING :

UNITS MARKED WITH RESISTANCE  
CODE AND 2 DIGIT DATE CODE

### PACKAGING :

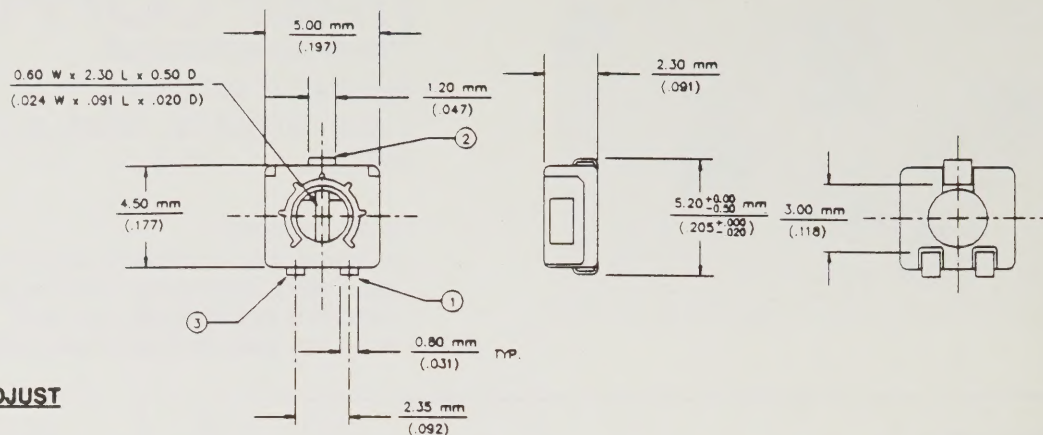
ADD DASH LETTER BEFOR PIN STYLE

NONE = BULK PACK

- T = TAPE AND REEL  
(500 Units / Reel)

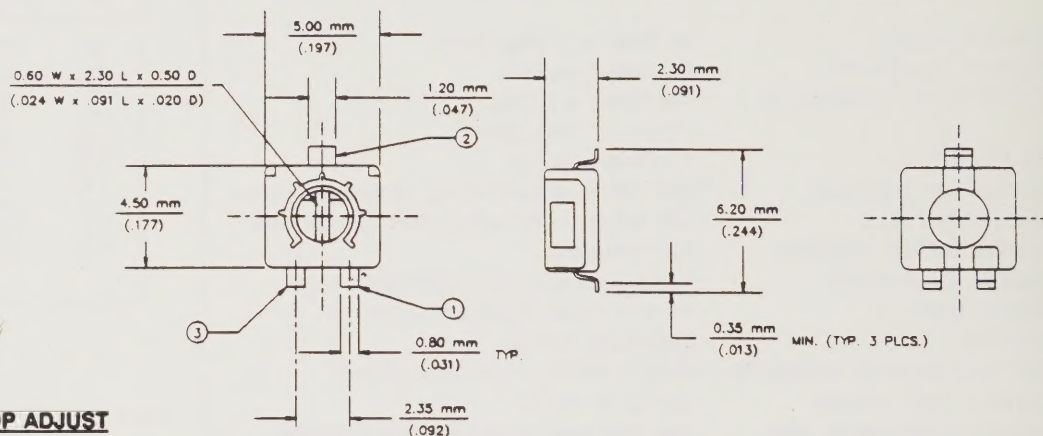
- M = MAGAZINE  
(50 Units / Magazine)





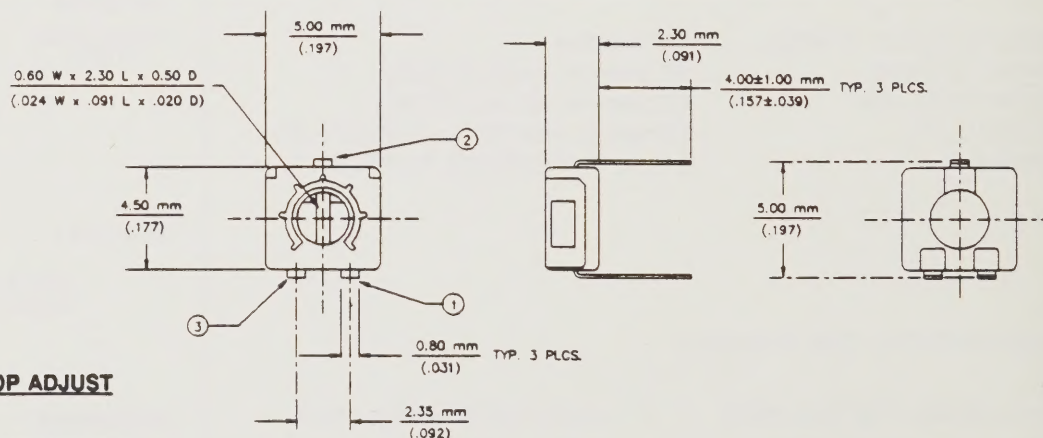
### J LEAD TOP ADJUST ST4A

AVAILABLE IN BULK, TAPE AND REEL AND MAGAZINE



### GULL WING TOP ADJUST ST4B

AVAILABLE IN BULK, TAPE AND REEL AND MAGAZINE



### THRU HOLE TOP ADJUST ST4C

AVAILABLE IN BULK AND MAGAZINE

METRIC

SK334 A

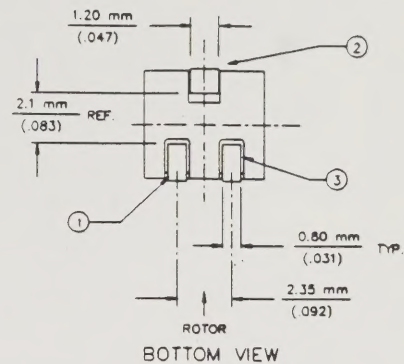
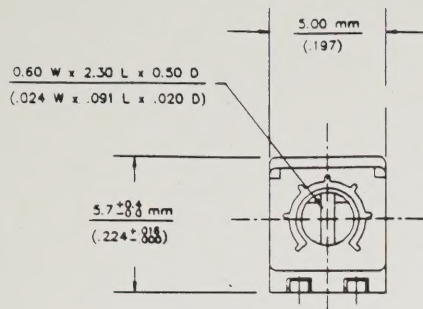
3. SEE PACKAGING OPTIONS ON FOLLOWING PAGES FOR PACKAGING DIMENSIONS.
2. TOLERANCES UNLESS OTHERWISE SPECIFIED  $\pm 0.30$  mm ( $\pm 0.012$  INCHES).
1. DIMENSIONS ARE IN MILLIMETERS (INCHES IN PARENTHESES ARE FOR REFERENCE ONLY).

NOTES :

## ST-4 SERIES 4 mm SINGLE TURN VARIABLE RESISTOR

SURFACE MOUNT AND LEADED



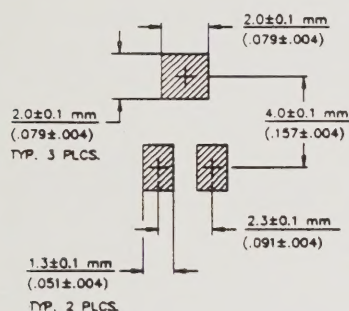


### J LEAD SIDE ADJUST

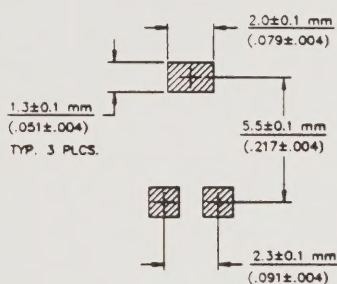
### ST4G

AVAILABLE IN BULK AND TAPE AND REEL

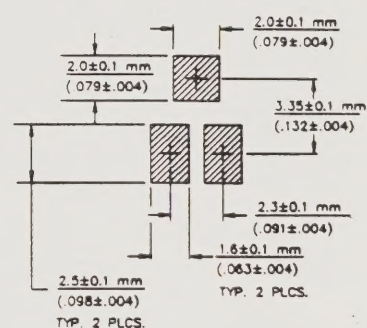
### ST4A



### ST4B



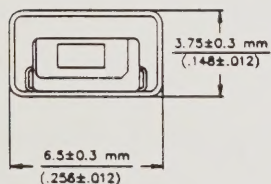
### ST4G



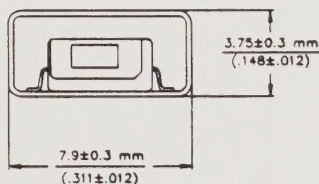
## SUGGESTED LAND PATTERNS

A AND B STYLES CONFORM TO INDUSTRY STANDARD, VRCI SMT-300, FOR 4 mm SINGLE TURN CENTER LINE OF PART FALLS ON CENTER LINE OF PATTERN.

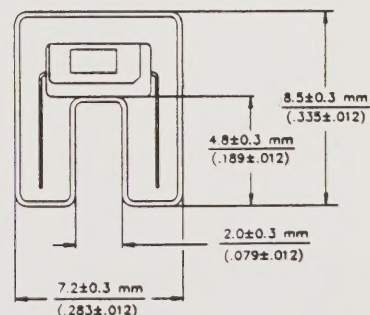
### ST4MA



### ST4MB



### ST4MC



## MAGAZINE PACKAGING DIMENSIONS

EACH MAGAZINE CONTAINS 50 UNITS and is 270 ± 2 mm (10.63 ± .079) LONG.

METRIC

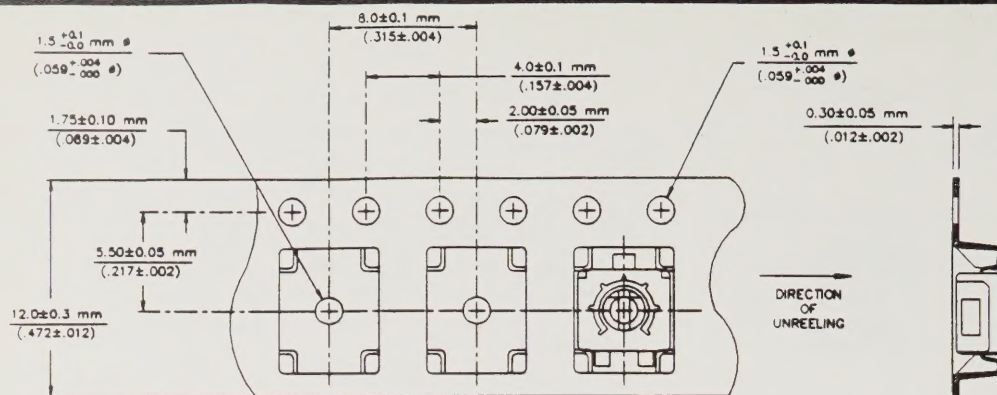
SK339B

3. SEE TAPE AND REEL OPTION ON FOLLOWING PAGES FOR TAPE AND REEL DIMENSIONS.
2. TOLERANCES UNLESS OTHERWISE SPECIFIED +/- 0.30 mm (+/- .012 INCHES).
1. DIMENSIONS ARE IN MILLIMETERS (INCHES IN PARENTHESES ARE FOR REFERENCE ONLY).

NOTES :

**ST-4 SERIES**  
**4 mm SINGLE TURN**  
**VARIABLE RESISTOR**  
**SURFACE MOUNT AND LEADED**



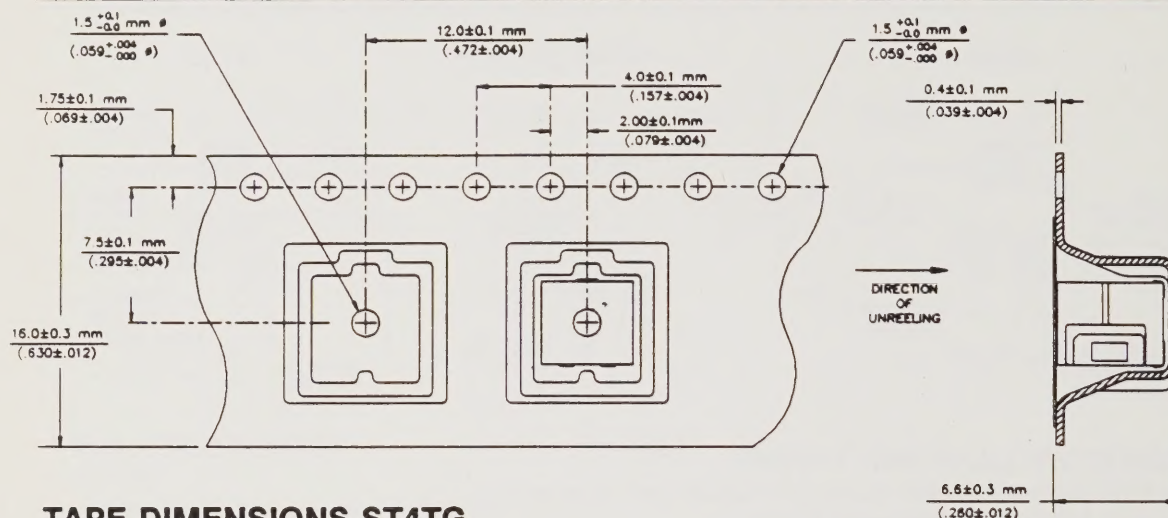


## TAPE DIMENSIONS ST4TA, ST4TB

8 mm PITCH ON 12 mm TAPE.

UNITS PACKAGED 500 PER REEL

COMFORMS TO EIA-481-A STANDARD FOR SURFACE MOUNT COMPONENTS.

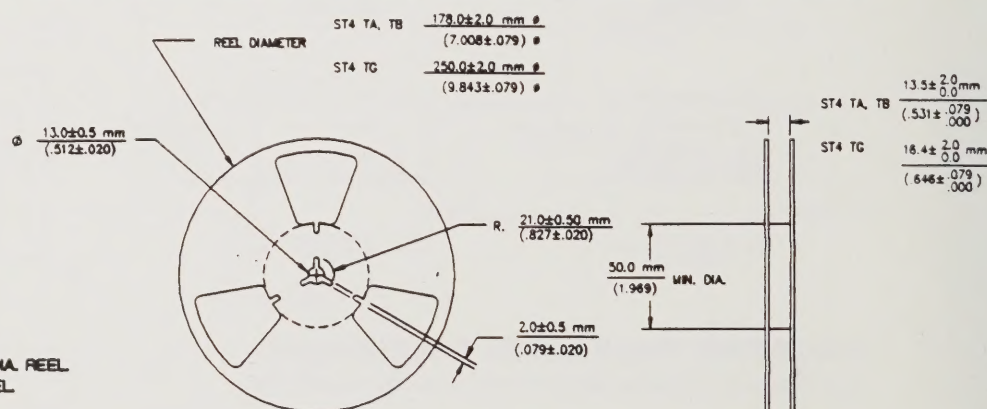


## TAPE DIMENSIONS ST4TG

12 mm PITCH ON 16 mm TAPE.

UNITS PACKAGED 500 PER REEL

COMFORMS TO EIA-481-A STANDARD FOR SURFACE MOUNT COMPONENTS.



## REEL DIMENSIONS

ST4 TA AND TB ON 178 mm (7 INCH) DIA. REEL

ST4 TG ON 250 mm (10 INCH) DIA. REEL

METRIC

SK 338 A

**ST-4 SERIES**  
**4 mm SINGLE TURN**  
**VARIABLE RESISTOR**

**SURFACE MOUNT**

2. TOLERANCES UNLESS OTHERWISE SPECIFIED  $\pm 0.30 \text{ mm}$  ( $\pm .012 \text{ INCHES}$ ).

1. DIMENSIONS ARE IN MILLIMETERS (INCHES IN PARENTHESES ARE FOR REFERENCE ONLY).

NOTES :



## Our Quality Commitment

**We are committed to a program of continuous improvement by:**

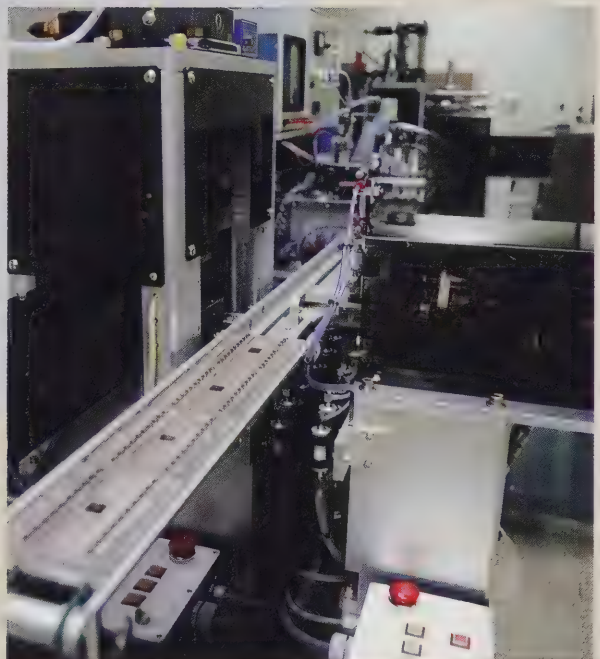
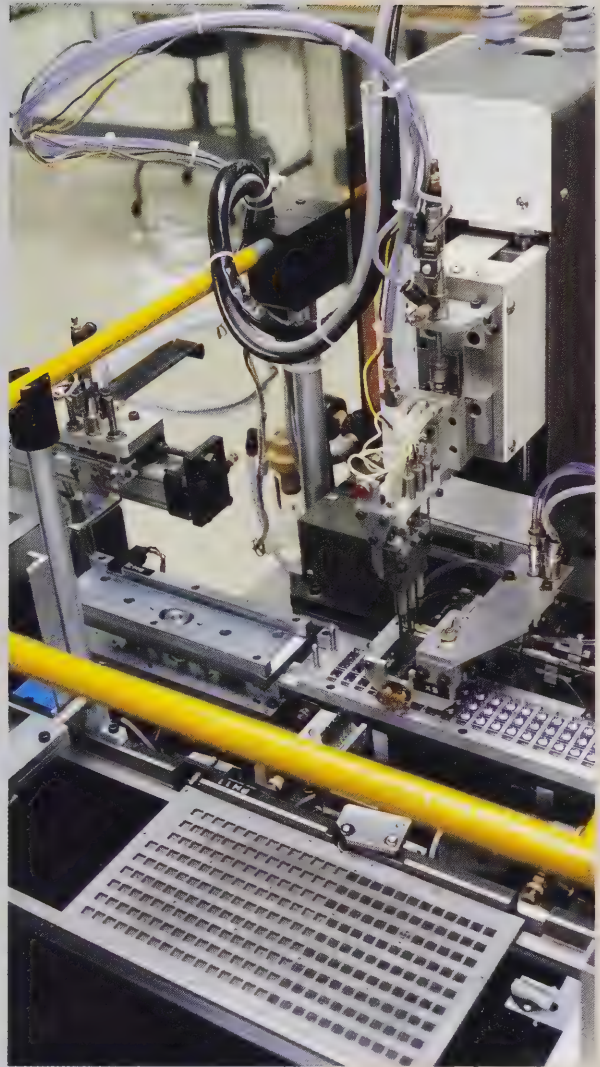
*Product Defect Prevention* - utilizing highly automated assembly with mechanized in-process inspections and controls.

*Quality Audits* - outgoing product is constantly audited and measured in PPM defective to assure the effectiveness of the quality systems and the SPC procedures.

*Administrative Error Prevention* - shipping and order entry transactions are continuously measured for progress in elimination of major error causes.

*On Time Shipments* - shipment performance against promise date is monitored to assure conformance.

*Lead Time Reduction* - JIT work flow procedures are utilized to reduce cycle time.

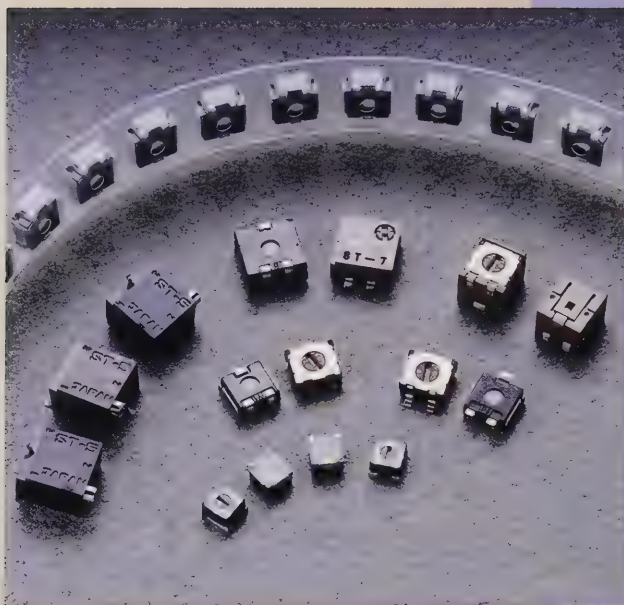


**Our commitment to quality is based on our dedication to Customer Satisfaction.**

**We provide the right product, at the right time, for the right price, everytime!**

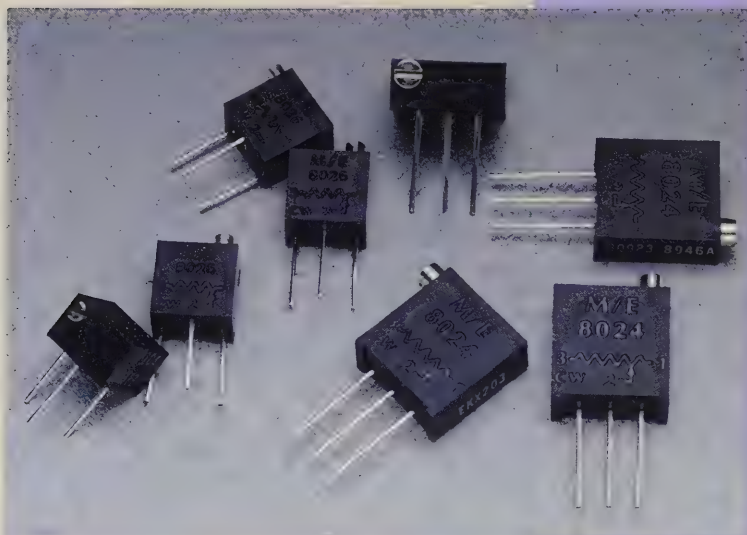


# Trimmers



## Surface Mount Cermet, Sealed

ST3	3 mm Sq.	Singleturn
ST4	4 mm Sq.	Singleturn
ST5	1/4" Sq.	Multiturn
ST7	7 mm Sq.	Multiturn



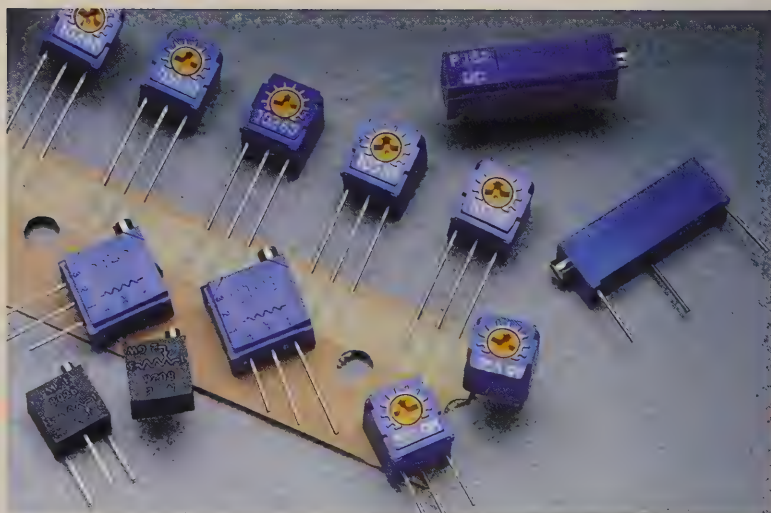
## Military Cermet, Sealed

RJ24	3/8" Sq.	Multiturn	MIL-R-22097
RJ26	1/4" Sq.	Multiturn	MIL-R-22097
RJR24	3/8" Sq.	Multiturn	MIL-R-39035
RJR26	1/4" Sq.	Multiturn	MIL-R-39035

## Industrial/Commercial Cermet, Sealed

CT6	1/4" Sq.	Singleturn
CT9	3/8" Sq.	Multiturn
CT20	3/4" Rect.	Multiturn
8026	1/4" Sq.	Multiturn

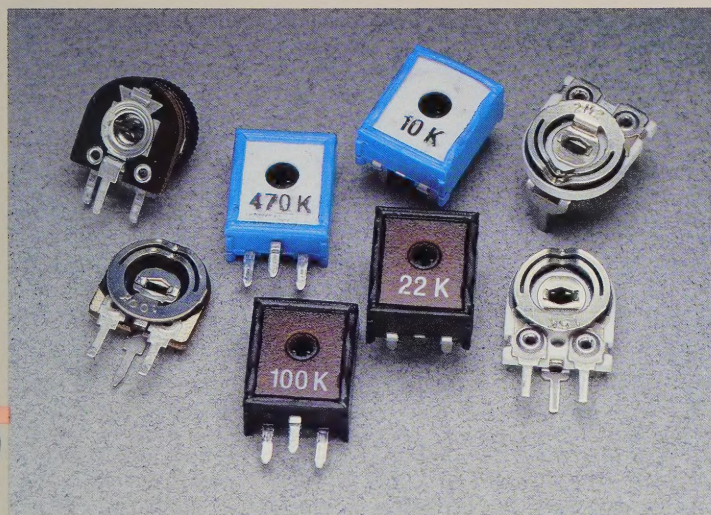
The most widely used general purpose trimmers are listed above. Additional models are listed in the "Trimmers Quick Reference Guide."





## Trimmers Quick Reference Guide

Description		Series	Turns	Resistance Range	Power Rating (°C)	Operating Temp. (°C)	Bulk	Packaging Magazine	Taped Reel
Sealed Cermet Industrial									
Singleturn	3/16" Rd.	RJ4	1	10-2 Meg	.50W @ 70°	-55 to +125	•		
	1/4" Rd.	RJ6	1	10-5 Meg	.50W @ 70°	-55 to +125	•		
	1/2" Rd.	RJ13	1	10-5 Meg	.75W @ 70°	-55 to +125	•		
	1/4" Sq.	CT6	1	10-2 Meg	.50W @ 70°	-55 to +125	•	•	•
	3/8" Sq.	8038	1	10-5 Meg	.50W @ 85°	-25 to +125	•		
Multiturn	5/16" Rd.	TM7	3	50-2 Meg	.50W @ 70°	-55 to +125	•		
	1/4" Sq.	8026	12	10-5 Meg	.25W @ 85°	-65 to +150	•		
	3/8" Sq.	8024	25	10-5 Meg	1.0W @ 70°	-65 to +150	•		
	3/8" Sq.	CT9	18	10-5 Meg	.50W @ 70°	-55 to +125	•		•
	3/4" Rect.	CT20	15	10-2 Meg	.75W @ 70°	-55 to +125	•		
Sealed Cermet Surface Mount									
Singleturn	3 mm Sq.	ST3	1	100-1 Meg	.10W @ 70°	-55 to +125	•		•
Singleturn	4 mm Sq.	ST4	1	10-2 Meg	.25W @ 70°	-55 to +125	•	•	•
Multiturn	1/4" Sq.	ST5	14	10-2 Meg	.25W @ 85°	-55 to +125	•	•	•
Multiturn	7 mm Sq.	ST7	3	50-1 Meg	.25W @ 70°	-55 to +125	•		•
Sealed Cermet Military									
Multiturn	MIL R 22097 1/4" Sq.	RJ26	12	100-1 Meg	.25W @ 85°	-65 to +150	•		
	3/8" Sq.	RJ24	25	100-1 Meg	.50W @ 85°	-65 to +150	•		
	MIL R 39035 1/4" Sq.	RJR26	12	100-1 Meg	.25W @ 85°	-65 to +150	•		
	3/8" Sq.	RJR24	25	100-1 Meg	.50W @ 85°	-65 to +150	•		
Consumer Grade									
Carbon	10 mm Sq., Open	410	1	47-4.7M	.10W @ 40°	-25 to +70	•		
	10 mm Sq., Enclosed	483	1	100-4.7M	.10W @ 40°	-25 to +100	•	•	
Cermet	10 mm Sq., Open	482	1	100-10 Meg	.50W @ 70°	-55 to +125	•		
	10 mm Sq., Enclosed	484	1	47-10 Meg	.50W @ 40°	-55 to +125	•	•	



### Consumer Grade Carbon & Cermet, Non-Sealed

#### Carbon Singleturn

2322-410	10 mm	Sq.	Open Frame
2322-483	10 mm	Sq.	Enclosed

#### Cermet Singleturn

2322-482	10 mm	Sq.	Open Frame
2322-484	10 mm	Sq.	Enclosed

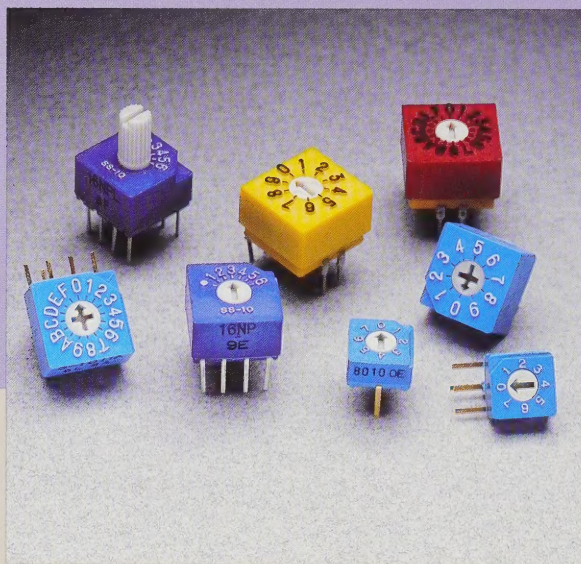


# Switches

## Switches Quick Reference Guide

Model	Positions	Type	Size
CS-4	2 Single or Double Pole 3 Single Pole	Selector / SMD	4 mm Sq.
SS-10	3 Double Pole 6 Single Pole	Selector / DIP	10 mm Sq.
S-1000	16 BCH	Digital / DIP	10 mm Sq.
S-2000	10 BCD	Digital / DIP	10 mm Sq.
S-5000*	10 BCD 16 BCH	Digital / DIP	11 mm Sq.
S-7000	10 BCD 16 BCH	Digital / SMD	7 mm Sq.
S-8000	8 BCO	Digital / DIP	7 mm Sq.

\*Available with Resistors and/or Diodes  
Call Your Local Sales Representative For Complete Specifications and Samples



### Rotary Coded Dip, Sealed

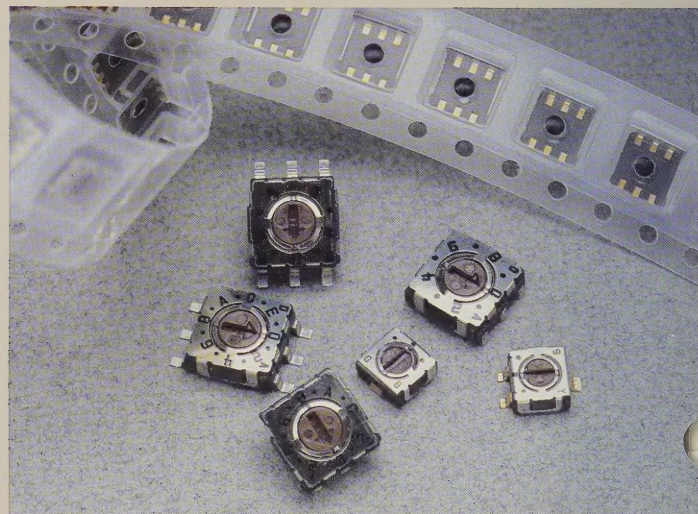
S-1000	10 mm Sq.
S-2000	10 mm Sq.
S-5000	11 mm Sq.
S-8000	7 mm Sq.

### Rotary Selector Dip, Sealed

SS-10	10 mm Sq.
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### Surface Mount, Sealed

CS-4	4 mm Sq. Selector
S-7000	7 mm Sq. Rotary Coded





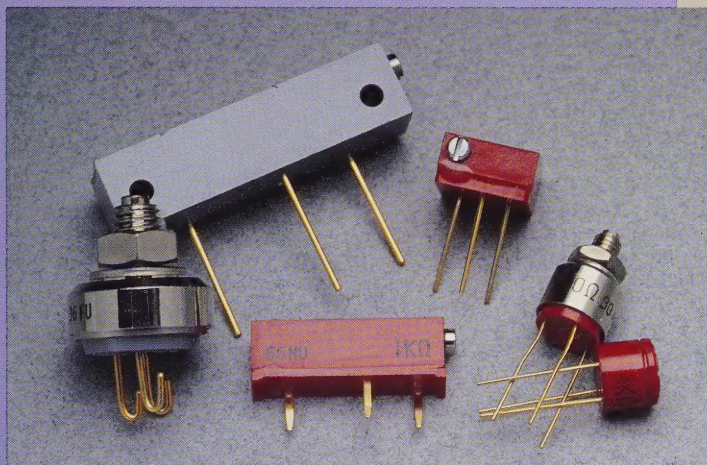
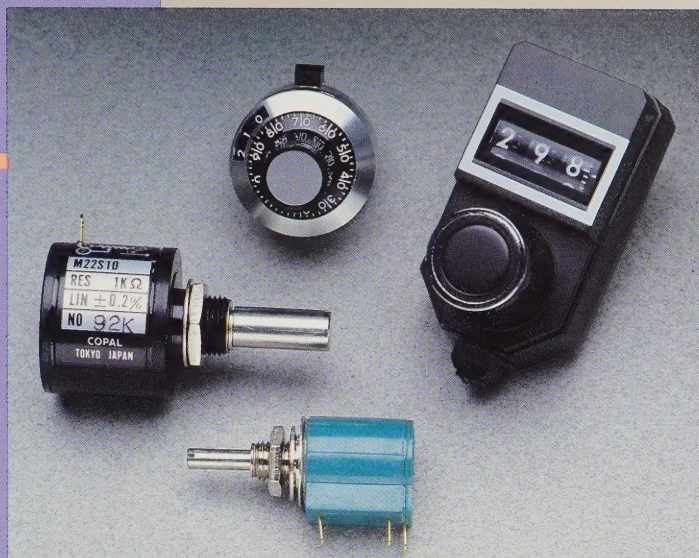
# Specialty Products

## Precision Potentiometers, Wirewound

M-13 Series 13 mm Dia. 3, 5 Turns  
M-22 Series 22 mm Dia. 5, 10 Turns

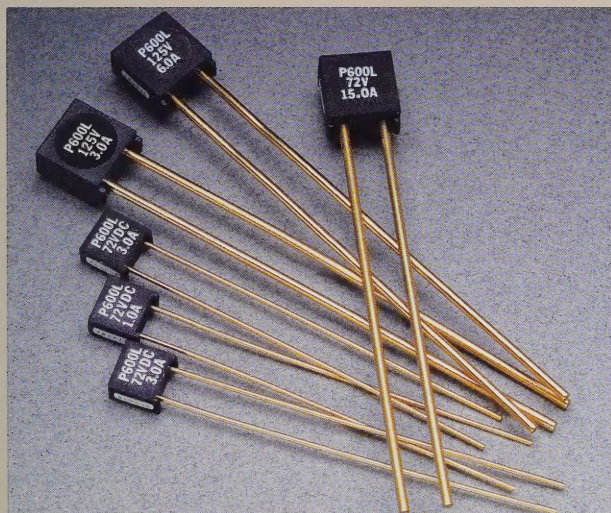
## Turns Counting Dials

CA 10 Analog 10 Turns  
CD 10 Digital 10 Turns



## Trimmers Wirewound, Sealed

1106	1/4" Rd.	Singleturn
1113	1/2" Rd.	Singleturn
1208	3/4" Rect.	Multiturn
1211	1-1/4" Rect.	Multiturn
1309	3/8" Sq.	Multiturn



## Current Limiting Fuses, High Reliability

P600L 1/8 - 15 Amps

Designed for use in applications where critical circuit protection is required.

Call Your Local Sales Representative For Complete Specifications



## Sales Offices and Manufacturer's Representatives

AL	Huntsville, Over & Over, Inc.	(205) 837-7105
AZ	Tempe, Philips Components	(602) 820-2225
CA	Anaheim, Philips Components	(714) 441-0385
CA	Folsom, Webster Associates	(916) 989-0843
CA	Mission Hills, Philips Components	(818) 891-6299
CA	San Diego, Philips Components	(619) 453-0332
CA	Santa Clara, Philips Components	(408) 727-6132
CA	Sunnyvale, Philips Components	(408) 746-2066
CO	Englewood, Philips Components	(303) 779-9696
FL	Altamonte Springs, Philips Components	(407) 339-5073
FL	Ft. Lauderdale, Philips Components	(305) 485-0115
GA	Norcross, Over & Over, Inc.	(404) 449-6205
GA	Roswell, Philips Components	(404) 992-0150
IA	Cedar Rapids, Lorenz Sales, Inc.	(319) 377-4666
IL	Bannockburn, GMR Sales, Inc.	(708) 295-8440
IL	Rolling Meadows, Philips Components	(708) 670-9494
IN	Fort Wayne, Corrao Marsh, Inc.	(219) 482-2725
IN	Greenfield, Corrao Marsh, Inc.	(317) 462-4446
IN	Kokomo, Philips Components	(317) 456-1615
KS	Overland Park, Lorenz Sales, Inc.	(913) 469-1312
KS	Wichita, Lorenz Sales, Inc.	(316) 721-0500
MA	Woburn, Philips Components	(617) 932-4748
MD	Columbia, Delta III Associates	(301) 730-4700
MI	Farmington Hills, Philips Components	(313) 553-6010
MN	Minneapolis, Electric Components Sales, Inc.	(612) 933-2594
MO	St. Louis, Lorenz Sales, Inc.	(314) 997-4558
NC	Charlotte, Over & Over, Inc.	(704) 542-9111
NC	Raleigh, Philips Components	(919) 782-3334
NC	Raleigh, Over & Over, Inc.	(919) 876-7338
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Printed in U.S.A. Release Date: 9/90 Ordering Code: PC580

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